

# Lewis Mitchell

## Curriculum Vitae

February 2023

📍 School of Mathematical Sciences, University of Adelaide,  
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## Employment

2022– **Professor of Data Science**, School of Computer and Mathematical Sciences, University of Adelaide.  
2021 **Associate Professor in Applied Mathematics**, School of Mathematical Sciences, University of Adelaide.  
2019–2020 **Senior Lecturer in Applied Mathematics**, School of Mathematical Sciences, University of Adelaide.  
2014–2018 **Lecturer in Applied Mathematics**, School of Mathematical Sciences, University of Adelaide.  
2011–2014 **Ed Lorenz postdoctoral research fellow in the mathematics of climate**, Computational Story Lab,  
Vermont Complex Systems Center, University of Vermont, USA.

## Education

2012 PhD in Applied Mathematics University of Sydney  
2007 BMath (Adv) (Hons) / BSc (Phys) University of Wollongong

## Honours and awards

2021 **JH Michell Medal** for outstanding new researchers, ANZIAM.  
2018 Australian Institute of Policy & Science **Young Tall Poppy Science Award**.  
2018 ACEMS Outstanding Achievements Recognition Award.  
2018 ACEMS Recognition for Outstanding Participation in Outreach Award.  
2017 Faculty of ECMS Excellence in Teaching Award.  
2010 TM Cherry Prize for best student talk, ANZIAM '10.  
2007 University Medal, University of Wollongong.

## Invited talks

- Invited plenary talks, *Data science and applied mathematics*, ANZIAM Conference/Australian Data Science Network Conference/AustMS Conference, February/November/December 2022. [\[youtube\]](#)
- Invited public lecture, *(Mis)(Dis)information, online social networks, and mathematics*, ACEMS Public Lecture Series, June 2021. [\[youtube\]](#)
- Invited speaker, *(Mis)Information flow in online social networks*, RMIT mathematics seminar, QMNET seminar, Information & Influence seminar, May-July 2021. [\[youtube\]](#)
- Invited speaker, *Social media and COVID-19*, Macquarie University mathematics seminar, University of Queensland pandemic seminar, June 2020.
- Keynote speaker, *Characterising information and happiness in online social activity*, 15th Annual Workshop of the Australasian Language Technology Association (ALTA '17), Brisbane QLD, December 2017.
- Invited speaker, *Studying human dynamics via social media (and more)*, St. Mark's College, Adelaide SA, September 2016.
- Invited speaker, *Happiness and the shapes of stories*, South Australian statistical society, Adelaide SA, May 2016.
- Invited speaker, *Information flows and their role in social predictability*, IEEE workshop on complex systems, Perth WA, October 2015.
- Invited speaker, *Hedonometers, Lexicocalorimeters, and more*, University of South Australia mathematics colloquium, July 2015.
- Invited speaker, *Shadowing inflation in ensemble data assimilation*, Nansen environmental and remote sensing centre (NERSC), Bergen, Norway, June 2015.
- Invited speaker, *Happiness, Geography, the Weather and Twitter: Using Data Science as a Microscope for Human Dynamics*, Johnson State College Science Speaker Series, Johnson VT, September 2013.
- Invited speaker, *Improving climate models using non-global data assimilation and parameter estimation*, MAA MathFest, Hartford CT, August 2013.
- Invited speaker, *Big Happy: Revealing the character of cities through data*, TEDx conference, Burlington VT, October 2012. [\[youtube\]](#)

## Grants

Since 2015 I have been awarded over \$4 million in externally-funded research grants, \$1.8 million as lead investigator. In 2021 I was also appointed as a (replacement) Chief Investigator for the [ARC Centre of Excellence for Mathematical and Statistical Frontiers \(ACEMS\)](#).

2023	K Ransom, L Mitchell, C Semmler, R Stephens. "RMANDO: Rhetorical Mapping and Narrative Detection Online". <i>Situational Awareness in the Information Environment</i> , DSTG.	\$100,000
2021–23	L Mitchell, JP Bagrow, M Roughan. "Mathematical modelling of information flow in social networks". <i>ARC Discovery Project DP210103700</i> .	\$390,000
2021–23	M Gillam, L Kelly, L Mitchell, R Lim, T Stanford. "Improving the safety of implantable medical devices". <i>NHMRC Ideas Grant 2002589</i> .	\$775,923
2021	T Graham, L Mitchell, R Ackland. "Grey Zone Theories and Models: Advanced Methods for Detecting and Countering Disinformation". <i>DST ORNet grant</i> .	\$100,000
2021	Y Kashima, R Ackland, L Mitchell, L Falzon, A Filinkov, D Kernot. "Grey Zone Theories and Models: Societal threats, psychosocial security, and collective information processing". <i>DST ORNet grant</i> .	\$100,000
2020–21	L Mitchell, N Geard. "COVID-19 Risk Mapping for State Government". <i>DST Multi-Party Collaborative Project Agreement 9930</i> .	\$28,148
2020–21	L Mitchell, F Neumann, M Nasim, D Weber, C Grimme, H Trautmann, D Assenmacher. "Detection and classification of malicious virtual grassroots influence campaigns in social media". <i>Universities Australia-DAAD (Germany) Australia-Germany Joint Research Cooperation Scheme</i> .	\$24,000
2020	L Mitchell. "Cyber-social-security during COVID-19: The social media reaction to COVIDSafe". <i>Cyber Security CRC</i> .	\$10,000
2019–2022	P Cassey, L Mitchell, R Brewer, J Facelli, P Caley. "Biosecurity surveillance of e-commerce and other online platforms for illegal trade in plants with potential for weed incursion and spread". <i>Centre for Invasive Species Solutions</i> .	\$349,782
2019–2020	L Mitchell, D Stephens. "Modelling in the grey zone". <i>DST Group, University of Adelaide</i> .	\$175,000
2018–2021	P Cassey, JV Ross, L Mitchell, J Austin, J Tyler, P Caley, D Ramsey, L Andrews, R Johnson. "Understanding and intervening in illegal trade in non-native species". <i>Centre for Invasive Species Solutions</i> .	\$665,000
2015–2019	L Mitchell, J Tuke, NG Bean. "Predicting civil unrest and election outcomes using Bayesian network models". <i>Data to Decisions CRC</i> .	\$661,261
2015–2019	L Mitchell, JV Ross, NG Bean. "Predicting common and novel disease outbreaks by assimilating open data into epidemiological models". <i>Data to Decisions CRC</i> .	\$637,606

## Teaching

- I won a **Faculty of ECMS Excellence in Teaching Award** for my lecturing in 2017.
- My student evaluations (SELTs) are consistently extremely high; I have been well **above the School, Faculty, and University averages for every question in every semester I have taught**.
- Program Coordinator, University of Adelaide online [Master of Data Science \(Applied\)](#) (2019-20), and Course Coordinator, Mathematical Foundations of Data Science (online).
- Course designer and instructor for two online MOOCs through the EdX platform: [Computational Thinking and Big Data](#), and [Big Data Analytics](#) (launched 2017). As of April 2018, these courses have a combined enrolment of over 40,000 learners.

## Course coordination

2022–	Mathematics of Artificial Intelligence	10 students
2021–	Optimisation III	60 students
2021	Advanced Mathematical Perspectives II	19 students
2019-21	Mathematical Foundations of Data Science (inc. online)	70 students
2019	Mathematics for Data Science I	185 students
2018-19	Applied Probability III	35 students
2016-17	Numerical Methods II	220-250 students
2015-17	Differential Equations II	120-150 students
2012-14	Calculus I (Uni. Vermont)	30 students

## Lecturing

2015	Numerical Methods II	240 students
2014	Mathematics IA	400 students

## Supervision

### Research staff

1. Dr Indu Bala, Postdoctoral research fellow on NHMRC Ideas Grant 2002589 *Improving the safety of implantable medical devices*, 2022–
2. Dr Anna Kalenkova, Postdoctoral research fellow on ARC DP210103700 *Mathematical modelling of information flow in social networks*, 2021-22. Continued to Lecturer in Computer Science, University of Adelaide.
3. Dr Oliver Stringham, Postdoctoral research fellow on CISS project *Understanding and intervening in illegal trade in non-native species*, 2018-21.
4. Dr Mehwish Nasim, Postdoctoral research fellow on D2D CRC project *Predicting civil unrest and election outcomes using Bayesian network models*, 2017-19. Continued to data scientist at Data61.
5. Dr Robert Cope, Postdoctoral research fellow on D2D CRC project *Predicting common and novel disease outbreaks by assimilating open data into epidemiological models*, 2016-19. Continued to lecturer at ANU.
6. Ms Saranzaya (Saka) Magsarjav, Research assistant on D2D CRC/DST Group projects, 2019. Continued to PhD with me.
7. Mr Andrew Nguyen, Research engineer on D2D CRC project *Predicting civil unrest and election outcomes using Bayesian network models*, 2017-19. Continued to software engineer with Sintelix.
8. Dr Ahmad Hossny, Postdoctoral research fellow on D2D CRC project *Predicting civil unrest and election outcomes using Bayesian network models*, 2015-17. Continued to senior data scientist with Algorythma.

### PhD

1. Ms Sara Benedetti, *Investigating information flow across multiple online social networks: a network science and information theory approach*, 2022–
2. Mr Scott Carnie-Bronca, *Identifying and preventing the coordinated spread of misinformation*, 2023–
3. Ms Saranzaya (Saka) Magsarjav, *Large-scale social media sentiment analysis as a predictor of public behaviour in Australia*, 2021–
4. Mr Curtis Murray, *Understanding patient experiences in healthcare through natural language processing*, 2020–
5. Mr Adam Toomes (School of Biological Sciences, Faculty of Science), *Analysing Dynamics of the Illegal Wildlife Trade in Australia*, 2018-22.
6. Dr Dennis Liu, *Early Warning Signals: The Interaction of Social Media With Vaccination and Disease Outbreak*, D2D CRC National Security Big Data top-up scholarship (\$30,000 p/a), 2017-21. Now data scientist at Hatch.
7. Dr Caitlin Gray, *Modelling Information Cascades: Creating Predictive Models on Temporal Networks*, D2D CRC National Security Big Data top-up scholarship (\$30,000 p/a), 2017-20. Now data scientist at Amazon.
8. Mr Max Glonek, *A Census of Social Media Users: Statistical Techniques for Quantifying and Correcting Biases in Big Open Data Sources*, 2016–
9. Dr Peter Mathews, *Trend Detection from Social Media Using Probabilistic Graphical Models*, 2016-18. Now senior data scientist at Salesforce.

### MPhil

1. Mr Ethan Johnson, *Analysis of users' behaviours in social networks using process mining techniques*, 2023–
2. Mr Oská Dubsky-Smith, *Using Twitter Posts to determine whether gender effects the sentiment of text*, 2023–
3. Ms Irulan Murphy, *Analysis of the trends, topics and sentiments of Australian television captions*, 2022–
4. Mr Cameron Cornell, *Influencer and contagion effects in speculative asset markets*, 2022–
5. Ms Bridget Smart, *An analysis of influence in online social networks*, 2021-22. Rhodes Scholar 2023.

6. Mr Joshua Watt, *Finding and modelling political Echo Chambers* online, 2021-22.
7. Mr Scott Carnie-Bronca, *Mathematics for last-mile transportation*, 2020-22. Continued to PhD with me.
8. Mr Joshua Price, *Optimising battery replacement in a fleet of scooters*, 2020-22.
9. Mr Benjamin Nagy (School of Classics, Faculty of Arts), *Carmen et Standard Error: Computational Methods for Stylistics in Latin Poetry*, 2019-22.
10. Ms Rose Crocker, *Using Data Assimilation and Lagrangian Coherent Structure Techniques to Improve Error Quantification in Geophysical and Climate Models*, 2019-21.
11. Mr Tobin South, *Information Propagation and Community Structure in Social Networks*, 2019-21.
12. Ms Ashley Dennis-Henderson, *Analysis of World War I Diaries Using Natural Language Processing*, 2018-20. Now PhD at University of Adelaide.
13. Mr Anton Andreacchio, *Applications of Complex Network Analysis for Strategic Decision Making in Australian Rules Football*, 2018-22 (part time).
14. Ms Jessica Penfold, *Exploring the Link Between Weather Factors and Influenza Dynamics*, 2017-18. Now full-time at DST Group.
15. Ms Michelle Edwards, *Temporal Analysis of Social Networks in Television Series*, 2017-19. Now full-time at Australian Bureau of Statistics.
16. Ms Vanessa Glenny, *A methodology for predictive topic modelling*, 2016-18. Now full-time with Australian Department of Defence.

### Honours

1. Mr Luke Pickering, *Novel clustering approaches for popular movies*, Hons I, 2017-19. Now data scientist with Sweat.
2. Ms Saranzaya (Saka) Magsarjav, *Analysis of signed networks in movies*, Hons I, 2018.
3. Mr Declan Jamieson, *Social network analysis of sports supporters: A case study of #BB07*, Hons II, 2018.
4. Ms Caitlin Gray, *Information cascades on random networks*, Hons I, 2016. Continued to PhD with me.
5. Ms Yiwen (Wendy) Li, *Prediction of civil unrest events using Poisson and Hawkes models*, Hons II, 2016. Now data scientist at UoA Waite campus.

### Summer research scholarships

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|---------|---|
| 2022/23 | Rebecca Li (UNSW)<br>Darvesh Singh<br>Sarthak Jain<br>Eugene Tan (ANU)  |
| 2021/22 | Alexandra Stephenson<br>Niamh Jones<br>Ben Lang<br>Tyson Rowe (AMSI vacation scholar)                                       |
| 2020/21 | Bridget Smart ( <a href="#">AMSI vacation scholar</a> , best AMSIConnect presentation award)<br>Niamh Jones                 |
| 2019/20 | Adam Toomes (APR.Intern with DST)   |
| 2018/19 | Isabelle Greco<br>John Davey ( <a href="#">AMSI vacation scholar</a> )<br>Ryan Wood<br>Tobin South                          |
| 2017/18 | Tobin South ( <a href="#">AMSI vacation scholar</a> , best AMSIConnect presentation award)<br>Saka Magsarjav<br>Joshua Dent |
| 2016/17 | Jessica Penfold ( <a href="#">AMSI vacation scholar</a> )<br>Rose Crocker<br>Michael Ucci<br>Tobin South                    |
| 2015/16 | Michelle Edwards<br>Amelia Briggs<br>James Walker   |

### Professional service & outreach

- Deputy Head of the School of Mathematical Sciences, 2021-22.
- Research and design for [The Hedonometer](#) and [Connect For](#) exhibits, [HEDONISM](#) exhibition, Museum of Discovery (MOD), Adelaide, May-Nov 2019.

- CHOOSEMATHS female high school student mentor, Australian Mathematical Sciences Institute (AMSI), 2017-19.
- Outreach committee, School of Mathematical Sciences, University of Adelaide, 2017-19.
- SACE board exam setting committee, 2017-18.
- School colloquium organiser, School of Mathematical Sciences, University of Adelaide, 2016.
- University of Adelaide Open Day organiser 2017-19, volunteer 2015-20. Volunteer presenter for *aMATHing Day*, *Ingenuity*, *MathsCraft* events, 2015-19. Designed outreach activity “How to be a data scientist: Shapes of movies through math” used in *Young Women in Technology* workshops 2015-16.
- Regular media interviews and comment for radio, news articles, podcasts (see *Selected media coverage* below), and write articles for blogs and online outlets such as *The Conversation* (see *Popular articles*), one of which was **published in *The Conversation's* book of the top 50 articles of 2017**.
- PhD thesis examiner, 2018; MPhil thesis examiner, 2017.
- Invited reviewer for *Nature Communications*, *Nature Human Behaviour*, *Scientific Reports*, *PLoS ONE*, *SIAM Journal on Applied Dynamical Systems*, *Medical Journal of Australia*, *Journal of Complex Networks*, *Journal of Machine Learning Research*, *Applied Network Science*, *Journal of the Atmospheric Sciences*, *Monthly Weather Review*, *Chaos*, *Psychological Reports*, *Journal of Computational Science*, *Nonprofit and Voluntary Sector Quarterly*, *International Journal of Geographical Information Science*, *Social Science and Medicine*, *BioMed Research International*, *Online Social Networks and Media*.

### Workshops and sessions organised

- *The 4th annual Australian Social Network Analysis Conference (ASNAC 2019)*. Organising and presentation selection committee member, Adelaide, South Australia, November 27-28 2019.
- *Predictability in Earth system processes. IMA hot topics workshop*, Minneapolis MN, November 18-21 2013.
- *Data assimilation and dynamical processes: Ocean, atmosphere and climate*. SIAM conference on mathematical and computational issues in the geosciences, Padova, Italy, April 2013.
- *Computational social science: An exploration of human dynamics*. SIAM conference on dynamical systems, Snowbird UT, May 2013.
- *Challenges in data assimilation and the mathematics of planet Earth and its climate*. Joint Mathematics Meetings 2013, San Diego CA, January 2013.
- *Data assimilation in large-scale weather and climate models*. SIAM conference on uncertainty quantification, Raleigh NC, April 2012.

## Publications

### Book chapters

1. Mitchell, L (2017b). “How the internet knows if you’re happy or sad”. In: *The Conversation Yearbook 2017: 50 stand-out articles from Australia’s top thinkers*. Melbourne: Melbourne University Press.

### Refereed research papers

1. Andreacchio, A, N Bean, and L Mitchell (2022). Modelling Australian Rules Football as spatial systems with pairwise comparisons. *Journal of Quantitative Analysis in Sports* **18**(4), 215–226.
2. Dharmapran, D, EV Jenkins, JX Quah, A Lahiri, K Tiver, L Mitchell, CP Bradley, M Hayward, DJ Paterson, P Taggart, et al. (2022). A governing equation for rotor and wavelet number in human clinical ventricular fibrillation: Implications for sudden cardiac death. *Heart rhythm* **19**(2), 295–305.
3. Jenkins, E, D Dharmapran, M Schopp, JX Quah, K Tiver, L Mitchell, F Xiong, M Aguilar, K Pope, F Akar, et al. (2022). The inspection paradox: An important consideration in the evaluation of rotor lifetimes in cardiac fibrillation. *Heart, Lung and Circulation* **31**, S133–S134.
4. Jenkins, EV, D Dharmapran, M Schopp, JX Quah, K Tiver, L Mitchell, K Pope, and AN Ganesan (2022). Understanding the origins of the basic equations of statistical fibrillatory dynamics. *Chaos: An Interdisciplinary Journal of Nonlinear Science* **32**(3), 032101.
5. South, T, B Smart, M Roughan, and L Mitchell (2022). Information flow estimation: a study of news on Twitter. *Online Social Networks and Media* **31**, 100231.
6. Thomas, EF, N Leggett, D Kernot, L Mitchell, S Magsarjav, and N Weber (2022). Reclaim the Beach: How Offline Events Shape Online Interactions and Networks Amongst Those Who Support and Oppose Right-Wing Protest. *Studies in Conflict & Terrorism*, 1–23.
7. Toomes, A, P García-Díaz, OC Stringham, JV Ross, L Mitchell, and P Cassey (2022). Drivers of the Australian native pet trade: The role of species traits, socioeconomic attributes and regulatory systems. *Journal of Applied Ecology* **59**(5), 1268–1278.



8. Weber, D, L Falzon, L Mitchell, and M Nasim (2022). Promoting and countering misinformation during Australia's 2019-2020 bushfires: a case study of polarisation. *Social Network Analysis and Mining* **12**(1), 64.
9. Gallagher, RJ, MR Frank, L Mitchell, AJ Schwartz, AJ Reagan, CM Danforth, and PS Dodds (2021). Generalized word shift graphs: A method for visualizing and explaining pairwise comparisons between texts. *EPJ Data Science* **10**, 4.
10. Ganesan, A, D Dharmapran, E Jenkins, M Aguilar, JX Quah, A Lahiri, K Tiver, L Mitchell, P Kuklik, C Meyer, et al. (2021). M/M/Infinity birth-death processes-a quantitative representational framework to summarize and explain phase singularity and wavelet dynamics in atrial fibrillation. *Frontiers in Physiology* **11**, 616866.
11. Garrett, PM, JP White, S Lewandowsky, Y Kashima, A Perfors, DR Little, N Geard, L Mitchell, M Tomko, and S Dennis (2021). The acceptability and uptake of smartphone tracking for COVID-19 in Australia. *Plos one* **16**(1), e0244827.
12. Stringham, O, PG Diaz, A Toomes, L Mitchell, J Ross, and P Cassey (2021). Live reptile smuggling is predicted by trends in the legal exotic pet trade. *Conservation Letters*.
13. Stringham, OC, S Moncayo, KG Hill, A Toomes, L Mitchell, JV Ross, and P Cassey (2021). Text classification to streamline online wildlife trade analyses. *PloS one* **16**(7), e0254007.
14. Weber, D, M Nasim, L Mitchell, and L Falzon (2021). Exploring the effect of streamed social media data variations on social network analysis. *Social Network Analysis and Mining* **11**(1), 62.
15. Zachreson, C, L Mitchell, M Lydeamore, N Rebuli, M Tomko, and N Geard (2021). Risk mapping for COVID-19 outbreaks using mobility data. *Journal of the Royal Society Interface* **18**, 20200657.
16. Gray, C, L Mitchell, and M Roughan (2020). Bayesian inference of network structure from information cascades. *IEEE Transactions on Signal and Information Processing over Networks* **6**, 371–381.
17. Hossny, AH, L Mitchell, N Lothian, and G Osborne (2020). Feature selection methods for event detection in Twitter: A text mining approach. *Social Network Analysis and Mining* **10**(1), 1–15.
18. Liu, D, L Mitchell, RC Cope, SJ Carlson, and JV Ross (2020). Elucidating user behaviours in a digital health surveillance system to correct prevalence estimates. *Epidemics* **33**, 100404.
19. Pond, T, S Magsarjav, T South, L Mitchell, and JP Bagrow (2020). Complex contagion features without social reinforcement in a model of social information flow. *Entropy* **22**(3), 265.
20. Roughan, M, L Mitchell, and T South (2020a). How the Avengers assemble: Ecological modelling of effective cast sizes for movies. *PLOS ONE* **15**(2), e0223833.
21. South, T, M Roughan, and L Mitchell (2020). Popularity and centrality in Spotify networks: critical transitions in eigenvector centrality. *Journal of Complex Networks* **8**(6), cnaa050.
22. Toomes, A, OC Stringham, L Mitchell, JV Ross, and P Cassey (2020). Australia's wish list of exotic pets: biosecurity and conservation implications of desired alien and illegal pet species. *NeoBiota* **60**, 43.
23. Tuke, J, A Nguyen, M Nasim, D Mellor, A Wickramasinghe, N Bean, and L Mitchell (2020). Pachinko Prediction: A Bayesian method for event prediction from social media data. *Information Processing & Management* **57**(2), 102147. arXiv: [1809.08427](https://arxiv.org/abs/1809.08427).
24. Bagrow, JP, X Liu, and L Mitchell (2019). Information flow reveals prediction limits in online social activity. *Nature Human Behaviour* **3**(2), 122–128. arXiv: [1708.04575](https://arxiv.org/abs/1708.04575).
25. Dharmapran, D, M Schopp, P Kuklik, D Chapman, A Lahiri, L Dykes, F Xiong, M Aguilar, B Strauss, L Mitchell, et al. (2019). Renewal theory provides a universal quantitative framework to characterise the continuous regeneration of rotational events in cardiac fibrillation. *Circulation: Arrhythmia and Electrophysiology* **12** (12), e007569.
26. Glonek, M, J Tuke, L Mitchell, and N Bean (2019). Semi-supervised graph labelling reveals increasing partisanship in the United States Congress. *Applied Network Science* **4**(1), 62.
27. Gray, C, L Mitchell, and M Roughan (2019). Generating Connected Random Graphs. *Journal of Complex Networks*, cnz011. arXiv: [1806.11276](https://arxiv.org/abs/1806.11276).
28. Bagrow, JP and L Mitchell (2018). The quoter model: A paradigmatic model of the social flow of written information. *Chaos* **28**, 075304. arXiv: [1711.00326](https://arxiv.org/abs/1711.00326).
29. Bellsy, T and L Mitchell (2018). A shadowing-based inflation scheme for ensemble data assimilation. *Physica D* **380-1**, 1–7. arXiv: [1805.07011](https://arxiv.org/abs/1805.07011).
30. Cope, RC, JV Ross, M Chilver, NP Stocks, and L Mitchell (2018). Characterising seasonal influenza epidemiology using primary care surveillance data. *PLOS computational biology* **14**(8), e1006377.
31. Hossny, AH, T Moschuo, G Osborne, L Mitchell, and N Lothian (2018). Enhancing keyword correlation for event detection in social networks using SVD and k-means: Twitter case study. *Social Network Analysis and Mining* **8**(1), 49.
32. Tiggemann, M, O Churches, L Mitchell, and Z Brown (2018). Tweeting weight loss: A comparison of #thinspiration and #fitspiration communities on Twitter. *Body Image* **25**, 133–138.

33. Venohr, M, SD Langhans, O Peters, F Hölker, R Arlinghaus, L Mitchell, and C Wolter (2018). The underestimated dynamics and impacts of water-based recreational activities on freshwater ecosystems. *Environmental reviews* **26** (2), 199–213.
34. Alajajian, SE, JR Williams, AJ Reagan, SC Alajajian, MR Frank, L Mitchell, J Lahne, CM Danforth, and PS Dodds (2017). The lexical calorimeter: Gauging public health through caloric input and output on social media. *PLOS ONE* **12**(2), e0168893.
35. Dodds, PS, DR Dewhurst, FF Hazlehurst, CM Van Oort, L Mitchell, AJ Reagan, JR Williams, and CM Danforth (2017). Simon's fundamental rich-get-richer model entails a dominant first-mover advantage. *Physical Review E* **95**(5), 052301.
36. Dodds, P, L Mitchell, A Reagan, and C Danforth (2016). Tracking climate change through the spatiotemporal dynamics of the Teletherms, the statistically hottest and coldest days of the year. *PLOS ONE* **11**(5), e0154184.
37. Kiley, DP, AJ Reagan, L Mitchell, CM Danforth, and PS Dodds (2016). Game story space of professional sports: Australian rules football. *Physical Review E* **93**(5), 052314.
38. Mitchell, L and JV Ross (2016). A data-driven model for influenza transmission incorporating media effects. *Royal Society Open Science* **3**, 160481.
39. Reagan, AJ, L Mitchell, D Kiley, CM Danforth, and PS Dodds (2016). The emotional arcs of stories are dominated by six basic shapes. *EPJ Data Science* **5**(1), 31.
40. Cody, EM, AJ Reagan, L Mitchell, PS Dodds, and CM Danforth (2015). Climate change Sentiment on Twitter: An unsolicited public opinion poll. *PLOS ONE* **10**(8), e0136092.
41. Dodds, PS, EM Clark, S Desu, MR Frank, AJ Reagan, JR Williams, L Mitchell, KD Harris, IM Kloumann, JP Bagrow, K Megerdooian, MT McMahon, BF Tivnan, and CM Danforth (2015). Common mistakes in measuring frequency-dependent word characteristics. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* **112**(23), E2984–E2985.
42. Dodds, PS, EM Clark, S Desu, MR Frank, AJ Reagan, JR Williams, L Mitchell, KD Harris, IM Kloumann, JP Bagrow, K Megerdooian, MT McMahon, BF Tivnan, and CM Danforth (2015). Human language reveals a universal positivity bias. *Proceedings of the National Academy of Sciences of the United States of America (PNAS)* **112**(8), 2389–2394.
43. Mitchell, L and A Carrassi (2015). Accounting for model error due to unresolved scales within ensemble Kalman filtering. *Quarterly Journal of the Royal Meteorological Society* **141**(689), 1417–1428. arXiv: [1409.0589](https://arxiv.org/abs/1409.0589).
44. Belsky, T, J Berwald, and L Mitchell (2014). Nonglobal parameter estimation using local ensemble Kalman filtering. *Monthly Weather Review* **142**(6), 2150–2164.
45. Frank, MR, L Mitchell, PS Dodds, and CM Danforth (2014). Standing swells surveyed showing surprisingly stable solutions for the Lorenz '96 model. *International Journal of Bifurcation and Chaos* **24**(10), 1430027.
46. Frank, MR, L Mitchell, PS Dodds, and CM Danforth (2013). Happiness and the patterns of life: A study of geolocated tweets. *Scientific Reports* **3**, 1–9.
47. Mitchell, L, MR Frank, KD Harris, PS Dodds, and CM Danforth (2013). The geography of happiness: Connecting Twitter sentiment and expression, demographics, and objective characteristics of place. *PLOS ONE* **8**(5), e64417.
48. Mitchell, L and GA Gottwald (2012a). Controlling model error of underdamped forecast models in sparse observational networks using a variance-limiting Kalman filter. *Quarterly Journal of the Royal Meteorological Society* **139**(670), 212–225.
49. Mitchell, L and GA Gottwald (2012b). Data assimilation in slow-fast systems using homogenized climate models. *Journal of the Atmospheric Sciences* **69**(4), 1359–1377.
50. Mitchell, L and GA Gottwald (2012c). On finite-size Lyapunov exponents in multiscale systems. *Chaos* **22**(023115).
51. Gottwald, GA, L Mitchell, and S Reich (2011). Controlling overestimation of error covariance in ensemble Kalman filters with sparse observations: A variance-limiting Kalman filter. *Monthly Weather Review* **139**(8), 2650–2667.
52. Zhu, S-P and L Mitchell (2011). Combined diffraction and radiation of ocean waves around an OWC device. *Journal of Applied Mathematics and Computing* **36**(1-2), 401–416.
53. Zhu, S-P and L Mitchell (2009). Diffraction of ocean waves around a hollow cylindrical shell structure. *Wave Motion* **46**(1), 78–88.

## Papers in refereed conference proceedings

1. Smart, B, J Watt, S Benedetti, L Mitchell, and M Roughan (2022). #IStandWithPutin versus #IStandWithUkraine: The interaction of bots and humans in discussion of the Russia/Ukraine war. In: *Social Informatics: 13th International Conference, SocInfo 2022, Glasgow, UK, October 19–21, 2022, Proceedings*. Springer, pp.34–53.

2. Murray, C, L Mitchell, J Tuke, and M Mackay (2021). Symptom extraction from the narratives of personal experiences with COVID-19 on Reddit. In: *MAISoN Workshop Proceedings of the 15th International AAAI Conference on Web and Social Media (ICWSM)*. arXiv: [2005.10454](#).
3. Dennis-Henderson, A, M Roughan, L Mitchell, and J Tuke (2020). Life still goes on: Analysing Australian WW1 Diaries through Distant Reading. In: *Proceedings of the The 4th Joint SIGHUM Workshop on Computational Linguistics for Cultural Heritage, Social Sciences, Humanities and Literature*, pp.90–104.
4. Edwards, M, L Mitchell, J Tuke, and M Roughan (2020). The one comparing narrative social network extraction techniques. In: *Proceedings of the 2020 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM '20)*, pp.905–14. arXiv: [1811.01467](#).
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